UNIVERSITY OF PUERTO RICO

MAYAGÜEZ CAMPUS

DEPARTMENT OF MARINE SCIENCES

STUDENT MANUAL

REGULATIONS AND REQUISITES OF THE MS AND PhD PROGRAMS IN MARINE SCIENCES

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NOTE: The information in this manual is subject to change without previous notification.

WELCOME

The faculty, administration and personnel of the Department of Marine Sciences of the University of Puerto Rico at Mayagüez welcome you to our graduate programs. We hope you will find these programs challenging, interesting and valuable.

We are pleased that among the numerous institutions and programs available, you selected us for your graduate studies. We too, make our selections with care because it is our students that make the DMS the exciting and dynamic place it is. Congratulations on your admission to this program.

Your progress and success in the DMS will depend on your academic foundations, your dedication to your graduate studies and to the establishment of an open communication with the members of this academic community: students, professors, researchers, and librarians. The sooner you initiate this communication the earlier you will begin to take full advantage of the learning opportunities that will help you advance your interests in the exciting fields of the Marine Sciences.

Please take time to read through this student manual to orient you on important information regarding departmental policies and procedures. For additional information on policies and procedures, please consult the Office of Graduate Students (http://grad.uprm.edu/oeg/EstudiantesActivos/Normas/), UPR Graduate Student Handbook (http://www.uprm.edu/procuraduria/reglamento_upr.html), UPRM Student Regulation handbook the Departmental Administration. Also, take the time, beginning as soon as possible, to become familiar with our faculty, their ongoing research projects and their publications. Attend our seminars and other interesting seminar series offered at the Mayagüez campus and visit the Marine Sciences library collection regularly. Begin your graduate education with a commitment to excellence and make it a very productive one.

Ernesto Weil, Ph.D.
Director

Note: The Student Manual of the Department of Marine Sciences is published to provide students and the public with information about the programs and policies of the department. Students are responsible for reading, understanding and following all policies and information contained herein. The information here provided complies with Certifications 09-09, 87-9b and the DMS regulations revision approved by the UPRM Graduate Council. All contents are subject to change by the University authorities without notice.

I. BRIEF HISTORIC REVIEW OF THE DEPARTMENT OF MARINE SCIENCES

The Department of Marine Sciences (DMS) has its origins in the Institute of Marine Biology (IMB) of the Department of Biology of the University of Puerto Rico at Mayagüez (UPRM). The institute was founded on February 8, 1954. The main offices of the IMB were located at the main campus at a building known as the Fisheries Building. Finally, the IMB activities were transferred to Isla Magueyes, La Parguera, where the IMB shared the 18-acre island with the Puerto Rico Zoo. The initial development of the IMB included the construction of modest research laboratory facilities, dormitories for researchers and students and a dock for the CARITE, a service vessel for the marine cages associated with the zoo.

In 1966, José E. Arrarás Esq., Chancellor of the formerly named Colegio de Agricultura y Artes Mecánicas de Mayagüez (CAAM), requested of Dr. Máximo Cerame Vivas, then assistant professor of the Department of Biology of the UPR Río Piedras Campus, to prepare a proposal for the creation of a new academic and technical program in Marine Sciences. That same year, Dr. Cerame submitted to the University authorities a proposal entitled "The Development of Studies in Marine Sciences in Puerto Rico for the next 25 years." This document described the justifications, advantages and the institutional and country-wide benefits of the establishment of a center for research and education in Marine Sciences. The proposal emphasized the potential and the importance of local environmental resources as well as the human resources available for the creation of such a center.

In January 1967, Dr. Máximo Cerame Vivas was appointed director of the IMB and entrusted with the structuring and organization of a graduate Department of Marine Sciences. The Certification that officially created the Department of Marine Sciences (DMS) was approved on August 19, 1968, by a resolution of the Puerto Rico Council of Higher Education. The DMS doctoral program was approved and established by the Council of Higher Education on November 17, 1972. Since its beginning, the DMS graduate program has been characterized as an interdisciplinary program integrating the disciplines of Biological, Chemical, Geological and Physical Oceanography.

The DMS was the first graduate department of the Mayagüez Campus and the quality of the research conducted and published soon merited national and international recognition as the first marine research center within the Caribbean region.

Through the present, the DMS has produced more than a thousand scientific publications, has hosted scientists from around the world and has graduated a total of 489 students (356 MsC and 133 PhD Students) The list of dissertations and theses could be seen at www.uprm.edu/cima. The initial modest facilities at Isla Magueyes have grown to include class rooms, offices, marine installations and research and teaching laboratories.

The progress and growth of the Department of Marine Sciences is due to the commitment of its faculty and its students. After Dr. Cerame Vivas' resignation in 1973, the DMS has been chaired by Dr. Francisco A. Pagán-Font, Dr. Manuel Hernández-Ávila, Dr. Thomas R. Tosteson, Dr. John M. Kubaryk, Dr. Dallas Alston, Dr. Nilda E. Aponte, Dr. Jorge Capella, Dr. Jose Lopez, Dr. Jorge Corredor, Dr. Ernesto Otero-Morales and presently, Dr. Ernesto Weil.

II. VISION AND MISSION OF THE DEPARTMENT OF MARINE SCIENCES

VISION:

- To increase knowledge of the marine environment by means of scientific research, and transmitting this knowledge to the larger academic community.
- To contribute to social and economic development of Puerto Rico through the conservation and rational uses of the marine environment.
- To provide leadership and serve as a model department for graduate education on the Mayagüez Campus.

MISSION:

The mission of the Department of Marine Sciences is to promote a greater understanding of the marine environment within the core areas of biological oceanography, physical oceanography, chemical oceanography and geological oceanography. The specific goals of the department are to increase knowledge in the marine sciences, to train graduate students in the marine sciences, and to serve the community. Original research by both faculty and students is the central focus of the department's program, emphasizes the complementary and mutualistic relationship among these goals.

The Department offers two postgraduate programs in Marine Sciences: Masters and Doctorate. The Master program can be conducted using three different plans: (i) Plan I with thesis, (ii) Plan II with project or (iii) Plan III by coursework only. Students successfully completing Plan I (Thesis) will be conferred the Master of Science degree (M.Sc.), whereas those completing Plan II (Project) or Plan III (Coursework) will be conferred a Professional Master degree (P.M.). In addition, those students enrolled in Plan I (Thesis), will be able to specialize in one of the following areas: Biological, Chemical, Geophysical and Physical Oceanography. The Doctorate program leads to the degree of Doctor of Philosophy (Ph.D.) in Marine Sciences and students enrolled in this program will also be able to specialize in one of the four oceanography areas listed above. These programs encompass both the full breadth of these disciplines and the specialization needed to develop specific technical and analytical skills within a larger scientific context. The program seeks to produce graduates with a strong background in marine sciences able to critically analyze problems and offer solutions through the application of scientific knowledge and research. Students are prepared for careers in teaching, research and industry, as well as resource and environmental management.

III. THE DEPARTMENT OF MARINE SCIENCES

A. General Information

The Department of Marine Sciences (DMS) is part of the College of Arts and Sciences of the University of Puerto Rico at Mayagüez. The DMS encompasses two graduate programs: i) the Master program leading to either the degree of Master of Science (M.Sc.) in Marine Sciences (if you do a thesis) or the degree of Professional Master (P.M.) in Marine Sciences (if you do a project or only coursework); and ii) the doctoral program leading to the degree of Doctor in Philosophy (Ph.D.) in Marine Sciences. The Curriculum is designed to familiarize graduate students with the interdisciplinary fields of marine sciences as well as to allow for specialization in one of the four major areas: Biological Oceanography, Geological Oceanography, Physical Oceanography, and Chemical Oceanography. These specializations apply to the M.Sc. and Ph. D. degrees, but not the P.M.

Although most of the academic activities are conducted at the marine laboratories located at Isla Magueyes, La Parguera, part of the curriculum is provided at the main campus. In addition, the P.M. (Plan II with project) fosters the collaboration with different partners outside the university (e.g. Federal and State environmental agencies, NGO's and private sector) in which the student engages in particular applied issues related to those partners. Students participating in this degree, could be expected to spend considerable part of their time in any of our partner institutions. In some cases, some of those partners might offer scholarships to students enrolled in Plan II (project).

To date, the Department of Marine Sciences has granted 133 Doctoral Degrees and 356 Masters Degrees. Graduates of our program have a history of excelling as leaders in academia and as consultants or researchers in private and governmental research and development agencies. The 10 year average student body at the Department of Marine Sciences is 58 students, ranging from 40-79 of which an average of 46% were in the PhD program. The program is highly diverse with faculty representing more than 5 countries, and with 33% of the student body from North, South and Central America, the Caribbean, Europe and Asia. The department is enriched by the participation in our research activities of numerous *Ad Honorem* faculty, Adjunct professors, postdoctoral scientists and external collaborators.

Scientific research is a cornerstone in the academic activities of the DMS. M.Sc. and PhD degrees in all specialties require original research by students that result in one or more publications according to the degree pursued. On the other hand, P.M. fosters the direct engagement of the student with organizations outside DMS, with the objective of introducing these students with current problems and questions directly related to those organizations. In general, the M.Sc. and Ph.D. pathways are designed for individuals that want to pursue an academic career, whereas the P.M. is directed at those students wanting to pursue a career in management, public service or private industry.

The general regulations for conducting graduate studies at the Mayagüez Campus are available at http://grad.uprm.edu . This document specifies the particular requisites for a degree at the DMS.

B. Location

Main Campus: The administrative offices of Department of Marine Sciences (DMS) are is located in the Physics, Geology and Marine Sciences Building (commonly known as the "Physics building and designated with the code "F") on the Mayagüez Campus of the University of Puerto Rico. Central Director's office and the academic officer are located at room F-205. Other departmental administrative offices are located in rooms F-429 and F-432 in the fourth floor. The Marine Sciences Library is located in F-208. The DMS also has classrooms, laboratories and student and faculty offices in the Physics building.

Isla Magueyes Marine Laboratories: The main DMS Research and Teaching facilities are located on the 18 acre Magueyes Island, just offshore from La Parguera town in Lajas, and 22 miles (45 min) from Mayagüez. Magueyes lies within a protected embayment of the La Parguera Natural Reserve, on the southwest coast of Puerto Rico. These installations include various specialized teaching and research laboratories in chemical and geological oceanography, marine invertebrate systematics, biology and evolution, marine biotechnology, bio-optical oceanography, remote sensing, marine microbiology, biogeochemistry, coral reef biology and ecology, coastal water quality, ichthyology, environmental impact detection, fisheries and quantitative ecology.

In addition to classroom and laboratory facilities, the marine station maintains a computer room, indoor and outdoor aquaria and tanks with running seawater, and two museums containing reference collections of fish and invertebrates. The field station is also equipped with a diverse marine fleet of small and medium-sized (15-24 feet) boats that are available for faculty, student, and visitors at affordable costs. Larger vessels are used by faculty and students that are supported by funded research projects that pay for the use of boats and the gas. The DMS also offers basic and advanced dive training for students and faculty as is required for their research. The DMS administrative personnel can provide you the necessary information on how to access these services.

IV. GENERAL REQUIREMENTS FOR ADMISSION TO THE DMS GRADUATE PROGRAMS

A. Requisites for Admission to the Master Programs

1. Applicants to the Master program (M.Sc. and P.M. degrees) in Marine Sciences should possess:

   a) A BS or master's degree, or its equivalent with a specialization in science or engineering from a recognized institution.

   b) A minimum general GPA of 3.0. However, applicants with a GPA of 2.8 or better may be considered if compelling circumstances[1] are

[1] Compelling circumstances may include demonstrated research experience and productivity; documented personal health circumstances that affected the student's academic performance for one or two semesters.

presented. Applicants with a GPA below 2.8 will not be considered. Students with a GPA between 2.8 and 3.0 will be considered for a Plan II or III.

c) Strong academic preparation in the field of general specialization (Biology, Geology, Physics, Chemistry), including university level courses (prerequisites) in calculus, physics, chemistry and general biology for all applicants (see below for minimum program pre-requisites).

(1) Calculus (1 semester)

(2) General Biology (1 year)

(3) Physics (1 year)

(4) General Chemistry (1 year)

(5) Organic Chemistry (1 semester), for DMS applicants in Chemical Oceanography. This requisite does not apply for those students pursuing the P.M. degree.

(6) Statistics and computer literacy are highly recommended.

(7) If some of the prerequisites are not met, the student might still be accepted but he or she will need to complete those prerequisites in the first two years of the program. Courses identified as prerequisites will need to be passed with A or B.

B. Requisites for Admission to the PhD Program

1. Applicants to the PhD program in Marine Sciences should possess:

a) A Master or its equivalent with a specialization in science or engineering from a recognized institution, or

A BS or its equivalent with specialization in science or engineering from a recognized institution, and with demonstrated research experience and productivity.

b) A minimum BS general GPA of 3.0. However, applicants with a Master Degree (GPA 3.3 and above) and a BS with a GPA of 2.8 and above will be considered if compelling circumstances are presented[2].

[2] Compelling circumstances may include demonstrated research experience and productivity; documented personal health circumstances that affected the student's academic performance for one or two semesters.

Applicants with a BS or BA GPAs below 2.8 will not be considered under any circumstances.

c) Strong academic preparation in the field of general specialization (Biology, Geology, Physics, Chemistry), including university level courses (prerequisites) in calculus, physics, chemistry and general biology for all applicants (see below for minimum program pre-requisites).

(1) Calculus (1 semester)

(2) General Biology (1 year)

(3) Physics (1 year)

(4) General Chemistry (1 year)

(5) Organic Chemistry (1 semester) for DMS applicants in Chemical Oceanography.

(6) Statistics and computer literacy are strongly recommended.

V. APPLICATION FOR ADMISSION AND ADMISSION PROCESS (Master AND Ph.D. PROGRAMS)

1. To be considered, the student must submit to the Office of Graduate Studies (OGS) the following documents and any other documents requested according to current OGS regulation:

   a) Application Form to the UPRM Graduate Program. In this application form, the M.Sc is described as "Plan I", whereas the P.M. is described as either "Plan II" (if the student does a research project) or "Plan III" (if the student finishes the P.M. only with coursework).

   b) Three letters of recommendation from individuals that can testify to the ability and commitment of the applicant to pursue graduate studies. At least two of these letters should come from professionals in the applicant's main field of expertise.

   c) Personal Statement: The applicant statement is an opportunity to put qualifications in context and to explain applicants' plans for graduate school. Topics to be included may be to the extent possible: i) what is envisioned for a research project; ii) why is this project or area of interest important; iii) why is the DMS an appropriate Institution to carry out your studies; iv) how did interest in this topic/area occur; v) what background do you have in this area; and vi) if there has been communication with a prospective advisor. For those students applying for the P.M. (Plan II or Plan III), details on research projects can be omitted. Applicants are encouraged to address any past problems in their record. PhD applicants are expected to provide a reasonably specific statement of the research project intended.

   d) Three Official Transcripts, as required by the Office of Graduate Studies.

   e) Results of the TOEFL Exam (if applicable according to regulations of the Office of Graduate Studies).

   f) Other evidence of professional excellence (publications, projects, participation in symposia and congresses) if available.

   g) For PhD applicants: A letter from a DMS Faculty Sponsor to ensure that the student and a prospective professor have discussed issues relating to compatibility in areas of research, appropriate laboratory facilities and financial support.

2. The complete set of documents is pre-evaluated by the Office of Graduate Studies and those candidates meeting the OGS admission requisites are submitted to the Department of Marine Sciences for evaluation by the DMS Graduate Policy Committee. After evaluating the applications, the Graduate Policy Committee members submit their recommendations to the Director of the Department for final decision. Results are then sent to the Office of Graduate Studies which communicates to the applicant the results of the process.

3. APPLY ONLINE AT: https://www.uprm.edu/oeg/en/admission-application/

VI. TYPES OF ADMISSION (Master AND PhD PROGRAMS)

A. General Considerations

1. Once admitted, students are expected to study within the degree area chosen at the time of application and admission (i.e. Biology, Chemistry, Geology or Physics). Areas of specialization apply for the M.Sc. and Ph.D. degrees, but do not apply for the P.M. degree.

2. Similarly, for those students admitted in the Master program, they are expected to study within the plan chosen at the time of application and admission (i.e. M.Sc. in Marine Sciences = Plan I, P.M. in Marine Sciences (*via* project = Plan II or P.M. in Marine Sciences (*via* coursework) = Plan III)

3. To change discipline under which the student was admitted requires approval of the DMS Graduate Policy Committee and the authorization of the Director of the Department. The student must submit the following documents to the DMS Graduate Policy Committee:

   a) A written petition stating reasons and justifications for the change.

   b) A new statement of interest.

   c) A letter of support from a potential new major professor. The letter should also include reasons for the change and should address deficiencies in the student's background and appropriate remedies.

4. For those students admitted in the Master Program, changing plans requires the approval of the DMS Graduate Policy Committee and the authorization of the Director of the Department. The documents needed for this request depend on the type of change.

   a) From Plan I to Plan II or III:

      (1) Complete the necessary form of graduate studies

(2) A written petition stating reasons and justifications for the change.

(3) If changing to Plan II (project), a letter from support from a potential new supervisor for the project.

b) From Plan II or III (P.M. degree) to plan I (M.Sc. degree).

(1) Complete the necessary form of graduate studies.

(2) A written petition stating reasons and justifications for the change.

(3) A new statement of interest.

(4) A letter of support from a potential new major professor. The letter should also include a strong justification on the ability of the student to complete the specific requirements of Plan (I) (i.e. submission of scientific paper to a peer reviewed journal). It is also important to explain how the new research of the student will be supported (i.e. funding).

B. Total Admission

1. Total Admission as regular student of the graduate program is granted to candidates that comply with all the requisites for admission.

C. Conditional Admission

1. Conditional Admission as regular student of the graduate program are granted:

a) To applicants with up to two of the previous mentioned course deficiencies, if other requirements are met.

b) To applicants judged to be deficient in courses related to the chosen specialty area, with specific course work to be recommended.

2. All course deficiencies must be made up within two years of enrollment, with grades according to current regulations in the Office of Graduate Studies. Applicants conditionally admitted may not receive any grade of C or lower in the first year after enrolling, while carrying a full academic load. Failure to satisfy the conditions for Conditional Acceptance will result in termination from the program.

D. Second Admissions

1. Second admissions are described in Certification 09-09 Article G.11.X and G.11.X.

2. A student may be granted a second admission to the DMS graduate program following suspension in cases where the student was suspended for exceeding time limits for study but were otherwise in good standing.

3. Students dismissed for academic failures such as three successive semesters on probation, failure to approve the courses assigned as deficiencies with grades of A or B, failure to approve the MS general oral exam, failure to pass PhD comprehensive exam in second opportunity, academic dishonesty or not otherwise in good standing at time of leaving the Department will not be considered for second admission.

4. The application for second admission should be accompanied by a letter from the student's major advisor informing the Graduate Policy Committee what the compelling reasons for a second admission are.

5. Students applying for second admission for exceeding time limits for completing the degree must provide the evidence to the DMS Graduate Policy Committee of the advanced level of their thesis or dissertation document in the form of a letter from the major professor. Second admission, under these circumstances implies a co-validation of all coursework and examinations passed at time of suspension.

    a) All students granted second admission after suspension for exhausting the time limits for completion of the degree will be required to turn in to their graduate committee a thesis draft during the first semester following the second admission.

    b) The thesis must then be defended within one year of the second admission.

6. Failure to comply with the conditions for the second admission will result in loss of co-validation of previous work, including courses and degree exams.

E. Internal Transfers Between DMS Programs

1. From the Master (M.Sc. or P.M.) to the PhD Program:

    a) A student whose performance and research output as a Master student exceeds the expectations of their Graduate Committee may request to be transferred to the PhD program. Those students enrolled in Plan III (P.M. by coursework), who do not have Graduate Committee; will have to be directly interviewed by the Graduate Policy Committee before the formal request is made. The Graduate Policy Committee will decide whether there are grounds for the request to continue.

b) The documentation required for Graduate Policy Committee evaluation of the request will be the same as for a new admission; however, the institutional process will be an internal transfer in which all the credits approved as an M.Sc student will be transferred towards the completion of the PhD.

c) Additional documents needed:

(1) A letter from the student requesting to be transferred from the MS to the PhD program.

(2) A letter from the student's graduate committee explaining the compelling reasons for the transfer including publications, proposals granted to the student, etc. For students enrolled in Plan III (by coursework only), who do not have a graduate committee, the letter should be provided by the potential future supervisor explaining why he/she believes the student will be able to pursue a Ph.D. program and sources of funding.

d) If the transfer is granted, admission date to the PhD program will be the date of registration in the first course taken as an MS student.

e) Time for completion of the PhD degree will be as stipulated in current regulations of the office of graduate studies.

2. From the PhD to the MS Program

a) Multiple reasons, including time constraints may compel a student with a BS or a Master obtained elsewhere to move from the PhD program to the Master program. Students requesting this transfer must be in good academic standing.

b) The documentation required for departmental evaluation will be the same as for a new admission, however the institutional process will be an internal transfer in which credits approved as a PhD student will be transferred towards the completion of the Master.

c) Additional documents needed:

(1) A letter from the student requesting to be transferred from the PhD to the Master program. The student will have to specify what Plan and degree he/she wants to pursue.

(2) A support letter from the student's Chairperson and the Graduate Committee Members explaining the reasons for the transfer. If a student's transfer to Plan III, the Graduate Committee is automatically dissolved.

d) If the transfer is granted, admission date to the Master program for this transfer student will be the date of registration in the first course (taken as a PhD student).

e) Time for completion of the Master degree (M.Sc. or P.M.) will be according to current regulations of the Office of Graduate Studies. Note: Students beyond the time constrain for the Master program are not eligible for transfer from the PhD to MS program.

VII. PROCESS AND REQUISITES TOWARDS A DEGREE IN MARINE SCIENCES

A. Student's Graduate Committee: Formation and Composition (Master Plan I and II and PhD)

1. The graduate committee of the student should be formed within the first year of enrollment in the Department.

2. The academic advisor (Chairperson) must be a faculty member of the Department of Marine Sciences. Under special circumstances a co-chair can be appointed from another department within UPRM.

3. The graduate committee is constituted by academically qualified persons, as described by the UPRM graduate regulations, related to the area of study

chosen by the student and advisor. Graduate committee members may be made up by faculty of the Department of Marine Sciences, professors of other University of Puerto Rico campuses, Mayagüez departments, or by competent professionals appointed as "Ad Honorem" faculty.

4. In the specific case of a student enrolled in Plan II (project), and conducting the project in an organization or institution different from DMS, one of the members of the graduate committee should be from that organization or institution. This person will be appointed as "Ad Honorem" faculty.

5. M.Sc. (Plan I) Graduate Committee shall consist of three to five members.

6. P.M. (Plan II) Graduate Committee shall consist of a maximum of three members. P.M. (Plan III) will not have a graduate committee. These students, however, will be guided with his/her coursework selection and load by a Faculty member of the department in collaboration with the director

7. PhD graduate committee shall consist of four to six members. a majority of these committee members must be faculty members of the department; at least one member of PhD committees must be from outside of the DMS.

8. It is the responsibility of M.Sc and PhD students to maintain contact and consult frequently with the members of his/her Graduate Committee, particularly when preparing the thesis proposal, while conducting the research and during the preparation of the thesis.

B. Changes to the Composition of the Student's Graduate Committee.

1. A STUDENT MAY CHOOSE TO CHANGE THE COMPOSITION OF HIS/HER GRADUATE COMMITTEE FOR DIVERSE ACADEMIC OR NON-ACADEMIC REASONS. ALL CHANGES TO THE COMPOSITION OF THE GRADUATE COMMITTEE MUST BE APPROVED BY THE DMS GRADUATE POLICY COMMITTEE AND THE DIRECTOR OF THE DEPARTMENT. THE DOCUMENT TO FORMALIZE SUCH CHANGES IS FORM DAAEG-004 OF THE OFFICE OF GRADUATE STUDIES. https://www.uprm.edu/oeg/wp-content/uploads/sites/23/2019/11/enmienda-plan-de-estudio-protect-form-nov10.pdf

2. If the committee reorganization includes a change in the Thesis advisor and a change in the research topic, the degree exams (M.Sc. Oral General Exam and PhD Comprehensive) approved by the student under his/her previous supervisors will be invalidated. This provides the new chairperson and the newly formed graduate committee the opportunity to test the student's general knowledge or his/her knowledge in the new field. With proper justifications, the newly formed graduate committee may recommend the revalidation of the exams previously approved by the student.

C. Plan of Graduate Study:

1. Preparation of the Plan of Study:

   a) The Plan of Graduate Study should follow the regulations and format established by the Office of Graduate Studies. The plan is prepared by the student in consultation with his/her major advisor and the graduate committee. The plan includes a list of the courses transferred and applied towards degree credits, courses taken, and courses to be taken to complete course credit requirements. It also formalizes the student's graduate committee. The Plan will also include deficiency courses that might have been identified in the admission process.

   b) The Plan of Graduate Study is an official document that should be signed by members of the student's Graduate Committee, the Chairperson of the Departmental Graduate Policy Committee and the Director of the Department. This signed document is submitted to the UPRM Registrar's Office (hardcopy) and Office of Graduate Studies during the student's second semester according to current regulations.

   c) In order to be eligible for an assistantship, the Plan of Graduate Study must have been approved.

2. Modifications/Amendments to the Plan of Study:

   a) To modify the course composition in the Plan of Graduate Study it is necessary to submit an amendment, as established by the Office of Graduate Studies (Form DAAEG-004). The modifications must be signed by the chairman of the graduate committee and all the members of the student's graduate committee. This process further requires the endorsement of the chairman of the graduate policy committee and approval of the Director of the DMS. The original document is sent to the Registrar's Office and a copy to the Office of Graduate Studies.

3. Co-Validation and Transfer of Graduate Courses to be Included in the Plan of Graduate Studies.

   a) Transfer courses are graduate courses approved at other departments or accredited institutions that may become part of the students' graduate plan. Transfer courses that are essentially equivalent to DMS courses may be considered for co-validation (or substitutes) for DMS courses. Co-validated courses may include one or more core courses. The number of credits accepted for transferred courses will be based on the analysis of the number of contact hours of the course conducted by registrar's office.

b) Students can request the co-validation or transfer of a limited number of specific courses to be substituted for other courses or to be included as part of their work program; however, the final accreditation of those courses will depend on the nature of the course content and will be evaluated and approved by the departmental graduate policy committee and the departmental chairperson.

c) Only graduate courses approved with A or B (or equivalents) in fully accredited institutions, and which have been taken no longer than 10 years prior to entering the graduate program can be considered for co-validation.

d) To determine if a transferred course can be co-validated, the student must provide an official course description for the semester/session that the course was completed, and a course syllabus. The co-validation will proceed if a DMS specialist verifies that the course is equivalent to the one offered at DMS. The process requires a final notification to the registrar's office.

e) Courses taken for pass/fail or satisfactory/unsatisfactory grades may be transferred but are not eligible for co-validation.

f) Credits from graduate seminars, courses in Special Topics or Special Problems and MS Thesis will not be transferable.

g) According to OGS regulations a minimum of 60% of the coursework must be approved at UPRM, the degree granting institution.

4. Transfer and Co-Validation of Credits from a MS Degree

a) Applicants who have completed a master's degree in Sciences, Mathematics or Engineering at a fully accredited university can transfer up to thirty (30) credit hours, taken during the course of studies for the Master's Degree, within ten (10) years of the application date to the Doctoral Program. Transferred courses should be recommended by the student's graduate committee based on their relevance to the candidate's research at DMS. These recommendations will be evaluated and approved by the Departmental Graduate Policy Committee and Departmental Chairperson before their inclusion in the student's plan of studies and submission to the Registrar's Office.

b) Applicants with master's degrees granted by fully accredited institutions from research (publication)-based programs that do not have a credit/course system, may be granted a maximum of 24 credits towards the PhD program. The final number of credits to be

granted should be recommended and justified by the student's graduate committee based on the relevance to the candidate's previous research and publications to his/her activities at the DMS. These recommendations will be evaluated and approved by the Departmental Graduate Policy Committee and Departmental Chairperson before their inclusion in the student's plan of studies and submission to the Registrar's Office.

c) Persons with continuous professional exposure to the field of Marine Sciences after obtaining their master's degree can request in writing a waiver of the time-limit on previous graduate courses. This waiver will be evaluated by the Departmental Graduate Policy Committee and Departmental Chairperson and informed to the Office of Graduate studies for approval before final submission to the Registrar's Office. The final number of credits to be granted should be recommended and justified by the student's graduate committee based on the relevance to the candidate's previous research and publications to his/her activities at the DMS.

d) In all cases the final transfer and co-validation of credits and the substitution of courses will be done following the procedures described by the Registrar's Office and the Office of Graduate Studies.

5. Co-Validation or Transfer of Graduate Courses Approved as Part of an Undergraduate Program

a) Co-validations or transfers of graduate courses approved by applicants as part of their undergraduate programs (BS, BA) will follow the regulations established by the Office of Graduate Studies.

D. Course Work (MS):

1. Master of Science (M.Sc.) in Marine Sciences (Plan I: Thesis)

The course work required for completion of an MS degree includes 32* graduate level credits distributed as follows:

Credits	Courses
12	CORE COURSES (Biological, Chemical, Geological and Physical Oceanography) all passed with grades of B or better
2	CIMA 8785 CURRENT TOPICS SEMINAR (CORE)
6	CIMA 6999. RESEARCH AND THESIS
3	CMOB 6635 RESEARCH METHODS IN MARINE SCIENCES, or equivalent CMOF 6005 METHODS OF OCEANOGRAPHIC DATA ANALYSIS (For students in Physical Oceanography) Graduate level Statistics for Biological, Chemical and Geological Oceanography Students.
9	Additional graduate courses available at DMS and other departments (chosen by the student after consultation with the advisor and or the Graduate Committee) (See UPRM Graduate Catalog)
32(*)	Total number of credits for completion of the MS degree

*According to regulations of the Office of Graduate Studies, a minimum of 60% of the coursework (21 credits) must be approved at UPRM as the degree granting institution.

2. Professional Master (P.M.) in Marine Sciences (Plan II: Project)

The course work required for completion of an MS degree includes 32* graduate level credits distributed as follows:

Credits	Courses
12	CORE COURSES (Biological, Chemical, Geological and Physical Oceanography) all passed with grades of B or better
6	CIMA 6900. GRADUATE RESEARCH PROJECT IN MARINE SCIENCES
14	Additional graduate courses available at DMS and other departments (chosen by the student after consultation with the advisor and or the Graduate Committee). The student must enroll at least THREE credits in each one of the disciplines of the department: CMOB, CMOF, CMOG and CMOQ. The following courses are strongly suggested: CMOB 6635 RESEARCH METHODS IN MARINE SCIENCES CMOF 6005 METHODS OF OCEANOGRAPHIC DATA ANALYSIS CMOG 8675 ADVANCED GEOLOGICAL OCEANOGRAPHY CMOQ 8638 LABORATORY OF CHEMICAL OCEANOGRAPHY If necessary, the Graduate committee can con-validate equivalent courses for those listed above.
32(*)	Total number of credits for completion of the MS degree

*According to regulations of the Office of Graduate Studies, a minimum of 60% of the coursework (21 credits) must be approved at UPRM as the degree granting institution.

3. Professional Master (P.M.) in Marine Sciences (Plan III: coursework)

The course work required for completion of an MS degree includes 36* graduate level credits distributed as follows:

Credits	Courses
12	CORE COURSES (Biological, Chemical, Geological and Physical Oceanography) all passed with grades of B or better
24	Additional graduate courses available at DMS and other departments (chosen by the student after consultation with the advisor and or the Graduate Committee). The student must enroll at least FOUR credits in each one of the disciplines of the department: CMOB, CMOF, CMOG and CMOQ. The following courses MUST be part of the study plan: CMOB 6635 RESEARCH METHODS IN MARINE SCIENCES CMOF 6005 METHODS OF OCEANOGRAPHIC DATA ANALYSIS CMOG 8675 ADVANCED GEOLOGICAL OCEANOGRAPHY CMOQ 8638 LABORATORY OF CHEMICAL OCEANOGRAPHY If necessary, the Graduate committee can con-validate equivalent courses for those listed above.
36(*)	Total number of credits for completion of the MS degree

*According to regulations of the Office of Graduate Studies, a minimum of 60% of the coursework (21 credits) must be approved at UPRM as the degree granting institution.

E. Course Work (PhD)

The course work required for completion of a PhD degree includes a total of 72* graduate-level credits beyond the baccalaureate degree distributed as follows:

Credits	Courses
12	CORE COURSES (Biological, Chemical, Geological and Physical Oceanography) all passed with grades of B or better.
2	CIMA 8785 CURRENT TOPICS SEMINAR (CORE)
12	CIMA 8999 DOCTORAL RESEARCH AND DISSERTATION
3	CMOB 6635 RESEARCH METHODS IN MARINE SCIENCES, or equivalent CMOF 6005 METHODS OF OCEANOGRAPHIC DATA ANALYSIS (For students in Physical Oceanography) Graduate level Statistics for Biological, Chemical and Geological Oceanography Students.
6	Advanced Courses in Marine Sciences in concentration discipline (See lists of DMS Courses)
Up to 30	Courses transferred from a recognized institution, as part of previous advanced degree (or advanced studies) or additional graduate courses available (chosen by the student following consultation with the student's advisor and graduate committee)at DMS and other departments
As needed	Additional graduate courses available at DMS and other departments (chosen by the student following consultation with the student's advisor and graduate committee)
72(*)	Total number of credits for completion of the PhD degree

*According to regulations of the Office of Graduate Studies, a minimum of 60% of the coursework (43 credits) must be approved at UPRM as the degree granting institution.

F. Additional Information about the Courses and Coursework

1. All Students who enroll in the DMS are required to take or co-validate four core courses in oceanography: Biological Oceanography (CMOB 6616); Chemical Oceanography (CMOQ 6615), Geological Oceanography (CMOG 6617) and Physical Oceanography (CMOF 6618). A minimum grade of "B" is required for all core courses. Students not passing core courses with an A or B must repeat that core course. A student may register a maximum of two times for any core course. Failure to pass the core courses in two opportunities results in suspension from the program.

2. Students enrolled in the P.M. program (Plan II: Project), are required to take 14 credits of elective courses. Out of those, at least three credits must be in each one of the disciplines of the DMS: CMOB, CMOF, CMOG and CMOQ. Co-validation of acceptable alternative courses might be considered by the Graduate Committee.

3. Students enrolled in the P.M. program (Plan III: Coursework), are required to take 24 credits of elective courses. Out of those, at least four credits must be in each one of the disciplines of the DMS: CMOB, CMOF, CMOG and CMOQ. The list of courses must include: CMOB 6635, CMOF 6005, CMOG 8675 and CMOQ 8638. Co-validation of acceptable alternative courses might be considered by the Graduate Committee.

4. Students enrolled in the M.Sc. program (Plan I: Thesis) are required to take a 2-credits Current Topics Seminar, CIMA 8785 (1 semester) and a 3 credit course in statistics, or oceanographic data analysis (for physical oceanographers). The latter may be satisfied by taking the appropriate course (CMOB6635, Research Methods in Marine Sciences, CMOF 6005 Oceanographic Data Analysis) offered within the DMS or by taking an acceptable alternative course, e.g., as offered by the Department of Mathematical Sciences or the Department of Agronomy.

5. Courses designated as Special Problems or Special Topics are not acceptable to fulfill the minimum requirements for advanced course in the core disciplines and cannot be co-validated from a previous degree. In the case of the P.M. program (Plan II or Plan III), Special Problems or Special Topics can be counted towards the credits of the four disciplines, this decision will be made by the graduate committee of the student. The decision will be made based on the relationship between the content of the special topic and the subdiscipline being considered for equivalency.

6. A maximum of 3 credit hours in courses designated as "Special Problems" or Special Topics may be applied towards degree requirements for the M.Sc (Plan I) or P.M. (Plan II or Plan III).

7. A maximum of 6 credit hours in courses designated as "Special Problems" or Special Topics may be applied towards degree requirements for the PhD

8. Note: There are situations where a course has not been formally approved and are taught under the title of Special Topics. These courses are considered to be "structured" at the discretion of DMS Director, and will not count against the number of special problems courses a student may apply towards degree credits.

9. Students must have formed a formal graduate committee before registering in either CIMA 6999 or CIMA 8999.

10. Courses offered in SCUBA diving training may not be applied towards degree requirements.

11. Advanced Courses: A minimum number of credit hours must be taken in "Advanced Courses". (Advanced courses are defined as those titled "Advanced ...." or have one or more prerequisite graduate courses.)

    a) A minimum of three (3) credit hours in advanced credits are required for the M.Sc. program (Plan I: Thesis).

    b) A minimum of six (6) credit hours in advanced credits are required for the PhD program.

VIII. RESEARCH PROPOSAL

1. M.Sc. (Plan I), P.M. (Plan II) and Ph.D. degrees require that the student carries out scientific research which will be outlined in a research proposal and culminates in a thesis (M.Sc. and Ph.D.) or project report (P.M. Plan II). Students in a P.M. (Plan III) do not have to conduct a scientific research in order to finish their degree. The difference between a Thesis and a project strives in the fact that: the thesis documents a research that explored a theoretical problem or their practical applications (if any), do not constitute the main objective of the work. On the other hand, a project report is directly oriented a solving a concrete problem typically related with the industry, commerce or any institution/organization outside the UPR system. Under some circumstances, project can also be conducted inside DMS or UPRM. Both documents, however, have in common that they have to be the individual work of the student and show: originality, creativity, organization and critical thinking. General guidelines for writing a thesis or project are provided by graduate studies (https://www.uprm.edu/oeg/wp-content/uploads/sites/23/2016/07/Gu%c3%adas-para-la-preparaci%c3%b3n-de-propuestas-tesis-proyectos-y-disertaciones.pdf) and also in the DMS STUDENT GUIDE FOR THE PREPARATION OF MASTER'S THESES AND DOCTORAL DISSERTATIONS.

2. P.M. (Plan II: Project) degree require that the student carries out scientific research which will be outlined in a research proposal and culminates in a final report, as described briefly in the following sections and in detail in the DMS STUDENT GUIDE FOR THE PREPARATION OF MASTER'S THESES AND DOCTORAL DISSERTATIONS.

3. Students doing a Thesis or Project must submit a proposal as described in the *DMS STUDENT GUIDE FOR THE PREPARATION OF MASTER'S THESES AND DOCTORAL DISSERTATIONS.* The document must be signed by the student's Graduate Committee and Director of the Department. In all cases a full proposal document should be submitted to the Department of Marine Sciences.

4. M.Sc. (Plan I: Thesis) Students - Full Thesis Proposal must be submitted to the Department of Marine Sciences before selecting a third enrollment in thesis credits and before the deadline established by the OGS for these cases. The signed cover page is submitted to the Office of Graduate Studies as evidence of fulfillment of the requirement.

5. P.M. (Plan II: Project) Students - Full Project Proposal must be submitted to the Department of Marine Sciences before selecting a second enrollment in thesis credits and before the deadline established by the OGS for these cases. The signed cover page is submitted to the Office of Graduate Studies as evidence of fulfillment of the requirement.

6. Ph.D. Students- Full Thesis Proposal must be submitted to the Department of Marine Sciences before selecting a third enrollment in thesis credits and before the deadline established by the OGS for these cases. The proposal and the signed cover page are submitted to the Office of Graduate Studies as evidence of fulfillment of the requirement.

IX. THESIS AND DISSERTATION

1. DMS theses (MSc) and dissertations (PhD) will consist of publication-ready manuscript(s) plus associated materials. Each manuscript will be a chapter of the thesis/dissertation and will be prepared in accordance with the style of the target journal to the fullest extent possible within the preparation guidelines of the Office of Graduate Studies. The full thesis/dissertation will consist of the combined manuscripts, plus an overall Abstract, overall Introduction, overall Discussion and combined Bibliography. The purpose of the overall Introduction and Discussion sections is to put into a unified context the work represented within the individual manuscripts (Chapters). For details see the DMS STUDENT GUIDE FOR THE PREPARATION OF MASTER'S THESES AND DOCTORAL DISSERTATIONS.

a) For the M.Sc. thesis (Plan I: Thesis), the minimum requirement is for one publication-ready manuscript (Chapter), approved by the graduate committee and already submitted and accepted for review by a peer-reviewed journal.

b) For the Doctoral Dissertation, the minimum requirement is for three (3) first author publication-ready manuscripts, approved by the graduate committee, of which one must already have been accepted for publication and two submitted and accepted for review by peer-reviewed journals. In all cases, acceptable manuscripts are full length research articles and not notes, short contributions, book reviews or abstracts. One peer-reviewed symposium proceedings may be applied towards the 3 manuscripts requirement for PhD candidates. Questions concerning suitability for meeting these requirements should be referred to the Graduate Policy Committee.

c) For the P.M. degrees (Plan II and Plan III) there is no publication or publication-ready requisite.

2. Submission of drafts and final document (M.Sc. (Plan I) and Ph.D.): When the thesis research has been completed (or parts of it), the student should proceed to work on the corresponding publication(s). To complete the process, the student should submit a draft of the thesis to his/her major advisor at least a semester in advance of the estimated date of thesis defense (see DMS STUDENT GUIDE FOR THE PREPARATION OF MASTER'S THESES AND DOCTORAL DISSERTATIONS). A polished thesis draft must be submitted to the full committee at least 1.5 months prior to submission to the Office of Graduate Studies. This allows the committee sufficient time to make corrections and suggest pertinent changes. The process is as follows:

a) Students must complete the form "Solicitud de Admisión al Examen de Defensa de Tesis o Informe de Proyecto". The student, in agreement with all members of the Graduate committee, will recommend a date for the examination. The thesis and other pertinent documents (including exam fees) should be delivered to the Office of Graduate Studies a minimum of 30 days prior to the defense of thesis and according to the OGS calendar.

b) It is the responsibility of all students to be aware of specific dates concerning the final allowable period for requesting the thesis defense and submitting theses each semester. Consult the UPRM Academic Calendar for these dates. At all times, follow the DMS and OGS regulations.

3. Project reports (P.M. Plan II) will consist of a concise and short manuscript that directly addresses the main question or problem of the project. This

manuscript will be written using as reference the DMS STUDENT GUIDE FOR THE PREPARATION OF MASTER'S THESES, PROJECT REPORTS AND DOCTORAL DISSERTATIONS. Following guidelines of the Office of Graduate Studies, the format of a Thesis and Project are similar; however the scope of the content of each section will be fundamentally different as described in the DMS student guide for the preparation of Master Theses, Projects Reports and Doctoral Dissertations.

X. SUSPENSION

1. Conditions for residence at the UPRM, suspension and probation are stipulated in the Certification 09-09.

2. In addition to the conditions for suspension stipulated in Certification 09-09, failure to pass the DMS core courses with grades of B or higher, after two opportunities, results in suspension from the graduate program (Certification 87-9B). A student that has been suspended for this cause will not be allowed to apply for a second admission.

XI. SPECIFIC REQUIREMENTS FOR THE MASTER OF SCIENCE DEGREE

A. Time for Completion

1. The maximum time to complete the requirements for graduation is 6 calendar years from the date of first registration after admission. For international students, the maximum time to complete the requirements for graduation is 3 years (Immigration Regulations; unless an extension is granted). Within this maximum of time, it is expected that students enrolled in M.Sc. (Plan I: Thesis) will finish their degree in 3 years, those enrolled in P.M. (Plan II: Project) will finish in 2.5 years and those enrolled in P.M. (Plan III: coursework) will finish in 2 years.

B. Course Work

1. M.Sc. (Plan I: Thesis) and P.M. (Plan II: project) require a minimum of 32 credit hours in order to comply with the requisites for those degrees. P.M. (Plan III: coursework) require a minimum of 36 credit hours in order to comply with the requisites for that degree.

2. The number of credit hours required includes the courses described in sections VIII.D and VIII.E (Above). A maximum of 6 credits may be taken at the level of advanced undergraduate (5000 level courses). Sixty percent of the course work should be approved at the DMS.

3. Those students enrolled in M.Sc, (Plan I: Thesis) and Ph.D., should carry out an original research project that will produce a publication-ready thesis or dissertation and manuscript (s) in peer reviewed journal (s) that are contributions to the advance of science and thesis (CIMA 6999, Research and Thesis, 6 credits and CIMA 8999 Research and Dissertation, 12 credits).

4. Those students enrolled in P.M. (Plan II: Project), should carry out research of an applied nature that represents a direct contribution towards a problem or question raised by the industry, agency, or any organization outside the UPR system. Under particular circumstances, such type of applied research could also be done within the UPR system, including the DMS. This decision will be made by the Graduate Committee of the student. Students in this Plan need to enroll CIMA 6900, Research Project in Marine Sciences, 6 credits.

C. General Oral Examination

1. All Masters students should pass an oral examination which characteristics will depend on the specific degree that the student is pursuing. In the case of the M.Sc. (Plan I: Thesis) and P.M. (Plan II: project), the exam will be administered by the student's Graduate Committee. In the case of the P.M. (Plan III: coursework), the exam will be administered by the Graduate Policy Committee of the Department. The exam results will be valid for two years. After this period, if the students has not defended and graduated, the exam must be taken again.

2. This General Oral examination must be taken:

   a) M.Sc. (Plan I: Thesis): no later than the semester following that in which the student has submitted the thesis proposal or the semester following completion of the required course work.

   b) P.M. (Plan II: Project): the same semester that the student enrolls for the first time in CIMA 6900 (Research Project in marine Sciences).

   c) P.M. (Plan III: Coursework): any time after completing the core courses.

3. The characteristics of this examination will be:

   a) M.Sc. (Plan I: Thesis): The exam will predominantly cover the core areas of marine sciences and aspects of the student's general area of specialization and will serve as an evaluation of the knowledge acquired by the student in the field of marine sciences. This examination will also cover the specific aspects of the area in which the student is developing his/her thesis. The exam will also serve to determine areas of needed improvement. Once the student has taken the exam the committee will take the appropriate measures, if

necessary, to correct deficiencies. These may take the form of recommended readings, additional coursework or other actions appropriate for the benefit of the student.

b) P.M. (Plan II: project): The exam will cover the specific area in which the student is doing the project. The exam will also cover the relationship between that specific area and general aspects of marine sciences. The exam will also serve to determine areas of needed improvement. Once the student has taken the exam the committee will take the appropriate measures, if necessary, to correct deficiencies. These may take the form of recommended readings, additional coursework or other actions appropriate for the benefit of the student.

c) P.M. (Plan III: coursework): The student will select, in conjunction with the graduate policy committee, a general topic related to at least two of the four disciplines of the program of marine sciences (Biological, Chemical, Geological and Physical Oceanography). Examples of this general topic could be: Effect of climate change (Physical) on coral reefs (Biological), Effects of acidification (Chemical) on accretion of corals (Geological). After selecting the topic, the graduate committee policy, will direct the student to the core literature to be reviewed for the chosen topic. The examination will cover any aspect (general or specific) contained in that core literature. The graduate policy committee can ask for guidance to experts in the specific areas to complete the list of core literature.

4. The format of the exam will be as follows:

a) M.Sc. (Plan I: Thesis):

i) Brief presentation (up to 15 mins) of student's progress in relation to his/her thesis.

ii) First round of questions by graduate committee in relation to specific topics of the area of the thesis (up to one hour).

iii) Second round of questions related to general aspects of the four disciplines of the DMS program. If possible, the relationship between the specific work of the student and the general aspects of marine sciences should be explored during this round (up to one hour).

iv) Final recommendations and suggestions (up to half an hour)

b) P.M. (Plan II: Project):

i) Brief presentation (up to 15 mins) by the student where he/she will present his/her project proposal.

ii) First round of questions by the student committee in relation to specific topics of the area of the thesis (up to one hour).

iii) Second round of questions by the student committee related to the utility and application of the project to the society, industry, organization, or institution (up to one hour).

iv) Final recommendations and suggestions (up to half an hour).

c) P.M. (Plan III: Coursework):

i) Presentation of the student about the chosen topic (up to 30 mins).

ii) First round of questions related to the presentation (up to 30 mins).

iii) Second round of questions related to the core literature that the graduate committee listed for the student. (up to 30 mins).

5. Since the examination process is run by either the student committee (Plan I and Plan II) or the graduate policy committee (Plan III), it is the responsibility of the student to contact the members of these committees well in advance to define the topics of the exam.

6. The results of the exam will be reported to the Office of Graduate Studies within 15 working days in a written document (Form DAAEG-21) signed by all members of the student's Graduate committee (Plan I and Plan II) or Graduate Policy committee (Plan III) and the Director of the Department.

7. If the student fails the examination, he/she will be permitted to take the examination a second time within a year of the first failure. If the student fails a second time, the student will be suspended from the program. Non-attendance at the exam, without approval of a request for postponement by the graduate policy committee is considered a failure.

D. Thesis/Project Defense

1. All students enrolled in M.Sc. or P.M. (Plan II) will be required to defend their thesis or project report. The thesis/project report defense will be conducted according to the guidelines established by the Office of Graduate Studies.

E. General Considerations:

Under special circumstances, exams and defenses will be allowed to be conducted using remote-online platforms.

XII. SPECIFIC REQUIREMENTS FOR THE DOCTOR OF PHILOSOPHY DEGREE

A. Time for Completion

1. For students admitted to the PhD program with a BS, the maximum time to complete the requirements for graduation will be 10 calendar years from the date of first registration after admission. For international students, the maximum time to complete the requirements for graduation is 6 years (Immigration Regulations, unless an extension is granted).

2. For students admitted to the PhD program with a MS, the maximum time to complete the requirements for graduation is 8 calendar years from the date of first registration after admission. For international students, the maximum time to complete the requirements for graduation is 4 years (Immigration Regulations, unless an extension is granted).

B. Course Work

1. Students admitted with a BS degree are required to complete 60 credit hours in course work and 12 credit hours for thesis research, for a total of 72 credits. Students, admitted with a Masters need to complete 48 credits including 12 credit hours of dissertation/thesis.

2. The student may complete a portion of these credit requisites with credits obtained while attaining the MS degree, with a maximum of up to 30 credits applied towards the PhD requirements (see section on co-validations and transfers). The student's graduate committee will recommend the additional courses to take. A maximum of 6 credits may be taken at the level of advanced undergraduate (5000 level courses), and these can be included among the 30 credits that are applied from previous MS or BS study. A minimum of 54 credits in courses will be at the graduate level, of those a minimum of 39 credits will be in the area of specialization, including 6 credits in advanced courses and a minimum of 15 credits outside the area of specialization, but in related areas. Courses such as special topics taken during the Master will not count towards the Ph.D.

3. The Graduate Committee will decide which courses taken by the student in his/her Masters Program in other institutions will be acceptable for transfer. If previous student course work is appropriate, courses may be substituted for specific or core course requirement, as for example Biological Oceanography or Quantitative methods. The Graduate Committee will send

their recommendation in writing to the Graduate Policy Committee and to the DMS director for a final decision.

4. Students should carry out research of an independent nature that represents a significant contribution towards furthering knowledge and prepare the corresponding publication-ready thesis (CIMA 8999, Doctoral Dissertation, 12 credits).

C. Qualifying Exam

1. All doctoral students must take a Qualifying Exam. This exam cannot be taken online. The Qualifying Exam must be taken at the end of the student's first semester.

2. The purpose of this exam is to identify areas in which the doctoral student requires improvement and the graduate committee will use results to help student organize his/her academic program . The qualifying exam is offered at the end of each semester in May and December

3. The exam will be prepared and administered by the Graduate Policy Committee of the Department in collaboration with the faculty, particularly the core course faculty. The exam will last 4 hours and will consist of objective questions taken from an accumulated archive of questions submitted by the DMS faculty. The exam will examine four main areas of Marine Sciences, i.e., Biological, Chemical, Geological and Physical Oceanography. The exam will test general knowledge considered to be basic to the individual disciplines (i.e., for students admitted in Biological Oceanography this would include questions on the broad principles of genetics, evolution, ecology, biochemistry, physiology, etc.).

4. The exam will be graded as Pass or Fail. The results of the exam will be reported to the Office of Graduate Studies within 15 working days in a written document (Form DAAEG-21) signed by all members of the Departmental Graduate Policy Committee and the Director of the Department. If the exam is failed twice, the Director of the Department will inform the Office of Graduate Studies that the student has been suspended from the DMS doctoral program.

D. Comprehensive Examination

1. All doctoral students must pass a Comprehensive Examination.

2. The exam will demonstrate that the student has sufficient knowledge in marine sciences and in his/her field of specialization that he/she merits status as degree candidate.

3. The student's major advisor will notify the DMS of date of administration of the exam. The exam should be taken after passing the qualifying exam and within a year of completing the course work in the doctoral program. The student's major advisor may solicit questions from the DMS faculty and the examination will be prepared by the student's Graduate Committee.

4. The written exam will be administered by the Office of the DMS director. This exam will be presential and cannot be done online.

5. The exam will consist of two parts. The first will be of 2 days duration (maximum of 8 hours each day) and will be comprised of essay answer questions. On each day of the examination, the student will be given 5 questions and will choose 4 to answer. Thus, a total of 8 questions will be answered by the student over the two days of the exam. Each answer is to be graded by two persons of the student's graduate committee (including the person submitting that question). No individual should grade more than 5 answers. Exam questions are graded as -, 0, or +. For purposes of grading, "-" is considered deficient; "0" is considered to be competent, and "+" is considered to be excellent. After adding all (16) of the individual scores, a final grade in the positive is considered passing. The corrected Comprehensive Examination will be made available to the student's entire Graduate Committee. Only the students passing the written part can move to the oral exam.

6. Once the first part of the exam has been graded and only if the student has been scored with a grade of "pass", the second part, an oral exam, will be administered within a period of 2-3 weeks after the first part. The oral exam will be of no more than 4 hours duration. The oral exam will be evaluated as Pass or Fail which will be decided by the Graduate Committee. The student must pass both parts of the exam. If a failure occurs at this stage, the oral portion must be repeated in the following semester. The results of the exam will be reported to the Office of Graduate Studies within 15 working days in a written document (Form DAAEG-21) signed by all members of the student's Graduate committee and the Director of the Department.

7. The DMS will communicate the results to the Office of Graduate Studies. If the exam is failed twice, the Director of the Department will inform the Office of Graduate Studies that the student has been suspended from the DMS doctoral program.

8. Non-attendance to any part of the exam of the exam, without approval of a request for postponement by the graduate policy committee or is considered a failure.

E. Dissertation Defense

1. Dissertation: The thesis defense must be announced to the general Departmental academic community at least two weeks prior to the examination. The regulations for administration of the exam are those of the Office of Graduate Studies of the UPRM.

XIII. GENERAL NOTES

1. You are responsible for being aware of and complying with the rules and regulations herein included and the rules and regulations of the Office of Graduate Studies. Certain regulations are subject to change.

2. The DMS will contact you by email to keep you informed on important general academic deadlines and University processes. However, you must keep in contact with the DMS to receive this information. For your benefit, KEEP YOUR CONTACT INFORMATION UPDATED.

3. At the end of every semester, you will be required to complete a Student Progress Report. The progress report is a summary of your academic activities and your progress towards completion of the degree. The student progress report must be signed by the thesis/dissertation chairperson.

4. You may request keys for the areas in which you will be conducting your work. Key application forms are available from the DMS offices and require the authorizing signature of the faculty in charge of the facilities and the Director of the Department.

5. Assistantships are processed electronically. The process is initiated at the Department or Office granting the assistantship. If you have a DMS assistantship (institutional or externally funded), make sure that the information is available to the DMS student affairs administrative personnel on or before the beginning of the semester. Delays in any part of this process results in delayed payments.

6. To obtain the director's signature on your final thesis document you will have to submit the DMS clearance form. This document certifies that you are in good standing concerning DMS material, equipment, keys, and library material.

XIV. DMS REGISTRATION PROCESS

1. Each semester, during the specified period of time, students should sign-in for the courses of their interest according to their Plan of Studies and the DMS curricular course offerings for the semester. Students are responsible for compliance with the pre-requisites of the courses they select.

2. After selecting the courses, these are entered to the UPRM electronic registration system by the DMS student affairs administrative personnel or

student counselor at the DMS Central offices in Mayagüez. This process must be done on the date and time assigned to you for registration.

3. Students registering in thesis (CIMA 6999), project (CIMA 6900) or Dissertation (CIMA 8999) should specify the number of credits for which they will be registering. You may register in CIMA 6999 and CIMA 6900 for a maximum of 6 (six) credits and CIMA 8999 for a maximum of twelve credits, and pay accordingly. Once you have registered and paid for the maximum number of credits for thesis/dissertation you may continue registering in the course for 0 (zero) credits.

   Note: Only students with a formal graduate committee and an approved Plan of Graduate Study are eligible for registration for CIMA 6999, CIMA 6900 and CIMA 8999.

   a) M.Sc. (Plan I Thesis) students: To register in thesis for a third semester, you must have an approved thesis proposal. To comply with the requirement at the Office of Graduate Studies you should submit the first page of the proposal with the corresponding signatures. Failure to comply with this requisite results in an inability to register in CIMA 6999.

   b) P.M. (Plan II: project) students: To register in project for a second semester, you must have and approved project proposal. The project proposal MUST be submitted and approved during the first semester the student enrolls in CIMA 6900.

   c) PhD Students: To register in dissertation for a third semester, you must have an approved thesis proposal. To comply with the requirement at the Office of Graduate Studies you must submit a copy of the full proposal with the corresponding signatures. Failure to comply with this requisite results in an inability to register in CIMA 8999.

4. The registration payment documents will be available at "Mi Portal Colegial" or at the Registration Center. If no changes are needed, the student may proceed to pay online at uprm.edu or personally at one of the offices of Banco Popular de Puerto Rico or one of the designated centers on the Mayagüez Campus.

5. Students registering for the first time must pay a $5.00 fee* at the UPRM Collecting Office (Finances) and go to the Student Center, 4th floor, to obtain an UPRM Student Identification Card. You will be required to present this identification for all your UPRM transactions and activities. (*subject to change without notice).

6. Modifications concerning your medical insurance should be done at the UPRM Medical Services Offices.

7. Student registration can only be done by you or a person you designate by means of a written authorization.

8. KEEP REGULAR CONTACT WITH THE DMS FOR INFORMATION ON REGISTRATION DATES.

XV. DIVING AT THE DMS

1. DMS Diving regulations are available in the Diving Safety Manual for the University of Puerto Rico Mayagüez Campus, Department of Marine Sciences. The manual outlines the administration and safety procedures for sanctioned diving operations at the Department of Marine Sciences, UPRM. This manual will be provided to you by the DMS Diving Safety Officer.

2. The DMS offers basic and advanced diving training and certification for students. Dive courses are non-credit courses. For more information about the DMS diving courses your may contact the DMS Diving Safety Officer.

3. ALL DMS diving activities must be authorized by the DMS Diving Safety Officer.

XVI. LIST OF APPENDICES

Appendix I: DMS Required and Elective Courses (From Certification 87-9a).

Appendix II: List of Courses Offered at the DMS (Active Courses).

Appendix III: Links to Forms and Documents for Graduate Studies Processes.

Appendix IV: DMS Directory.

Appendix V: General Contact Information.

Appendix I. DMS Required and Elective Courses (From Certification 20-52).

(1) CORE COURSES, COMMON TO ALL PROGRAMS (PhD AND P.M. M.Sc.) AND AREAS OF SPECIALIZATION

Course Code	Title	Credits
CMOQ 6615	Chemical Oceanography	3
CMOG 6616	Geological Oceanography	3
CMOF 6617	Physical Oceanography	3
CMOB 6618	Biological Oceanography	3
TOTAL		12

(2) COURSE WORK REQUIRED BY AREAS OF SPECIALIZATION (M.Sc. Plan I: Thesis and Ph.D.)

Biological Oceanography

COURSE OR COURSE DESCRIPTION	CREDITS	
	M.Sc. (Plan I)	PhD
REQUIRED COURSES (CORE)	12	12
CIMA 8785 Seminar	2	2
Thesis Research or Dissertation	6	12
Graduate level Statistics or Quantitative Methods CMOB 6635. Research Methods in Marine Sciences or	3	3
Advanced courses in area of specialization (Required)	3	6-9
Other courses in Marine Sciences (or other departments) recommended by the students graduate committee	6	34-37
Maximum number of credits that may be co-validated from previous relevant degree	0	Up to 30
TOTAL CREDITS	32	72

Chemical Oceanography

COURSE OR COURSE DESCRIPTION	CREDITS	
	M.Sc. (Plan I)	PhD
REQUIRED COURSES (CORE)	12	12
CIMA 8785 Seminar	2	2
Thesis Research or Doctoral Dissertation	6	12
CMOQ 8616. Oceanographic Techniques	3	3
CMOQ 8638. Chemical Oceanography Laboratory	3	3
Graduate level Statistics CMOB 6635. Research Methods in Marine Sciences	3	3
Advanced Chemistry Course	3	3
Other courses in Marine Sciences recommended by the students graduate committee	0	34
Maximum number of credits that may be co-validated from previous relevant degree	0	Up to 30
TOTAL CREDITS	32	72

Physical Oceanography

COURSE OR COURSE DESCRIPTION	CREDITS	
	M.Sc. (Plan I)	PhD
REQUIRED COURSES (CORES)	12	12
CIMA 8785 Seminar	2	2
Thesis Research or Doctoral Dissertation	6	12
CMOF 6005 Methods of oceanographic data analysis	3	3
CMOF 6631 Geophysical fluid dynamics I	3	3
CMOF 6632 Geophysical fluid II	0	3
Other courses in Marine Sciences (or other Departments) recommended by the student's graduate committee	6	37
Maximum number of credits that may be co-validated from previous relevant degree	0	30
TOTAL CREDITS	32	72

Geological Oceanography

COURSE OR COURSE DESCRIPTION	CREDITS	
	M.Sc. (Plan I)	PhD
REQUIRED COURSES (CORE)	12	12
CIMA 8785 Seminar	2	2
Thesis Research or Doctoral Dissertation	6	12
Graduate level Statistics CMOB 6635. Research Methods in Marine Sciences	3	3
CMOG 8675 Advanced geological oceanography	3	3
Other courses in Marine Sciences (or other Departments) recommended by the students graduate committee	6	37
Maximum number of credits that may be co-validated from previous relevant degree	0	30
TOTAL CREDITS	32	72

(3) COURSE WORK REQUIRED FOR THE P.M. degrees (Plan II: project and Plan 3: coursework)

COURSE OR COURSE DESCRIPTION	CREDITS	
	P.M. (Plan II)	P.M. (Plan III)
REQUIRED COURSES (CORE)	12	12
Research Project	6	N/A
CMOB 6635. Research Methods in Marine Sciences	3	3
CMOG 8675 Advanced geological oceanography	3	3
CMOF 6005 Methods of oceanographic data analysis	3	3
CMOQ 8638. Chemical Oceanography Laboratory	3	3
Other courses in Marine Sciences (or other Departments) recommended by the students graduate committee	At least 2	12*
Maximum number of credits that may be co-validated from previous relevant degree	0	0
TOTAL CREDITS	32	36

- *NOTE: those credits should be divided among the four disciplines of the DMS (CMOB, CMOF, CMOG and CMOQ).*

Appendix II. List of DMS Active Courses

ADVANCED UNDERGRADUATE COURSES

Advanced Undergraduate Courses

CIMA 5005. INTRODUCTION TO OCEANOGRAPHY (I, II) (On demand).
Three credit hours. Three hours of lecture per week. Prerequisite: authorization of the Director of the Department.
Basic knowledge, techniques, and areas of interest of the different disciplines of marine sciences. The interaction and research aims in Physical, Geological, Chemical and Biological Oceanography.

CIMA 5007 INTRODUCTION TO OCEAN OBSERVATION.
Three credit hours. Three hours of lecture per week.
Discussion of the scientific and practical applications of ocean observation. Evaluation of the different types of observation platforms form the most traditional such as buoys and ships to the modern autonomous submersible vehicles and satellites in polar and geostationary orbits. Investigation of the different types of physical, chemical, and biological sensors installed on these platforms, as well as their principles of operation, limitations and environmental and energy requirements. Evaluation of telemetry protocols and data storage in the operation of the observation system.

CIMA 5008. LABORATORY OF INTRODUCTION TO OCEANOGRAPHY.
One credit hour. Three hours of laboratory per week. Corequisite: CIMA 5005
Application of basic knowledge and techniques in different areas and disciplines of interest within marine sciences. The application exercises present the research aims, scopes, and interaction between Physical, Geological, Chemical, and Biological Oceanography.

CMOB 5017. MARINE ECOLOGY AND RESOURCE MANAGEMENT.
Five credit hours. Three hours of lecture and two three-hour laboratories per week. Prerequisite: authorization of the Director of the Department.
Description of the marine environment and familiarization with the major tropical marine communities; data-gathering and biological sampling techniques; human impact on the marine environment from the standpoint of pollution, exploitation, protection, and regulation; jurisprudence in major litigation involving marine resources; management practices.

CMOF 5015. PHYSICAL OCEANOGRAPHY FOR ATMOSPHERIC SCIENCES.
Three credit hours. Three hours of lecture per week. Prerequisites: MATE 4009 and (FISI 3272 or FISI 3162) or authorization of the Director of the Department.
Introduction to topics in physical oceanography such as heat budget, physical properties of seawater, oceanic mixing processes, and equations of conservation of heat, salt and momentum. Analysis of the origin of marine currents by applying the concepts of potential vorticity conservation and Sverdrup circulation. Description of the mechanics of surface and deep currents.

CMOG 5001. INTRODUCTION TO CLIMATE CHANGE.
Three credit hours. Three hours of lecture per week. Prerequisite: authorization of the Director of the Department. Overview of the principles of Earth's climate covering a broad range of phenomena that influence climate at various regional and global time scales and resolutions. Discussion of climate forced by external controls. Description of the effects of internal forces and their variability, and human-induced climate change. Emphasis on the role of greenhouse gases and rates of change of these processes. Discussion of the future climate change scenarios and possible mitigating steps.

CMOG 5002. LABORATORY OF INTRODUCTION TO CLIMATE CHANGE**.**
One credit hour. Three hours of laboratory per week. Corequisite: CMOG 5001.
Application and analyses of the principles of Earth's climate covering a broad range of phenomena forced by external controls. Laboratory exercises include the use of proxy data, climate modeling, and analysis of climate change impacts

GENERAL GRADUATE COURSES

CIMA 6900. GRADUATE RESEARCH PROJECT IN MARINE SCIENCES. Zero to six credit hours. One hour of discussion and eight hours of research per week. Prerequisites: Approve three of four core courses: (**CMOB 6618**-Biological Oceanography and **CMOF 6617** –Physical Oceanography and **CMOG 6616**-Geological Oceanography and **CMOQ 6615**-Chemical Oceanography) or authorization of the Director of the Department.Comprehensive study of a problem related to any of the marine sciences disciplines, biological, physical, geological and/or chemical oceanography, which integrates the knowledge acquired in the program. The project could be done in house (CIMA) or in any other institution (public or private) and the selected topic will depend on the student's interest. At the end of the project, the student must submit a final report that shows main results, acquired experience and applications. This report will be evaluated by the student's graduate committee.

CIMA 6999. RESEARCH AND THESIS (I, II, S).
One to six credit hours.
Up to a maximum of six credits representing the research and thesis may be granted towards the master of science degree.

CIMA 8785. CURRENT TOPICS SEMINAR (II).
Two credit hours. Two hours of lecture per week.
Recent topics in marine sciences and related fields.

CIMA 8998. SPECIAL PROBLEMS (I, II, S).
One to three credit hours. One to three sessions per week.
Tutorial discussion and/or laboratory and library
research on a special topic.

CIMA 8999. DOCTORAL RESEARCH AND DISSERTATION (I, II, S).
Up to twelve credit hours.
Up to a maximum of twelve credits representing the dissertation may be granted toward the Doctor of Philosophy degree.

BIOLOGICAL OCEANOGRAPHY (CMOB)

GRADUATE COURSES

CMOB 6018. MARINE ECOLOGY (I, II)
(On demand). Four credit hours. Three hours of lecture and one three-hour laboratory per week. Structure and function of marine ecosystems; flux of energy and materials in biogeochemical cycles.

CMOB 6078. ANALYSIS OF SPATIAL DATA IN MARINE ECOLOGY.
Three credit hours. Three hours of lecture per week.
Collection and analysis of spatial data in marine ecology within a geographic information system and landscape ecological context with applications to ecological problems. Emphasis on ecological issues in the marine environment and their application to marine resources management. A research project is required.

CMOB 6079. DNA DATA ANALYSIS OF MARINE ORGANISMS
Six credit hours. Three hours of lecture and six hours of laboratory per week.
Introduction to modern marine population genetics and phylogenetics of marine species. Study of the different types of molecular data and their collection; phylogeny reconstruction by parsimony, distance, and likelihood methods; tests of the molecular clock for dating speciation events; Darwininian selection at the molecular level, interspecies variation, detection of population structure; and genomic evolution. Analysis of real data from the marine scientific literature with computer software in population genetics and phylogenetics.

CMOB 6618. BIOLOGICAL OCEANOGRAPHY(I).
Three credit hours. Two hours of lecture and one three-hour laboratory per week. Marine life and its relationship to geological, physical and chemical aspects of the ocean; basic techniques fundamental to marine research. Demonstrations and field trips.

CMOB 6619. BIO-OPTICAL OCEANOGRAPHY (I)
(On demand). Four credit hours. Three hours of lecture and one three-hour laboratory per week. Integrated study of the role of light in aquatic ecosystems including the physics of light transmission within water, the biochemistry and physiology of aquatic photosynthesis, and the ecological relationships that depend on the underwater light environment. Field trips required.

CMOB 6635. RESEARCH METHODS IN MARINE SCIENCES (II).
Three credit hours. Three hours of lecture per week.
Techniques of data collection, analysis, and interpretation with emphasis on research problems relevant to the marine ecosystems of Puerto Rico.

CMOB 6655. MOLECULAR MARINE BIOLOGY (I, II)
(On demand). Four credit hours. Two hours of lecture and two three-hour laboratories per week.
Prerequisite: authorization of the Director of the Department.
Theory, practice, and applications of molecular marine biology.

CMOB 8635. MARINE MICROBIOLOGY.
Three credit hours. Two lectures and one three-hour laboratory per week.
Analysis of marine microorganisms with emphasis on their functions in nutrient cycling in the ocean, and the role of algae, bacteria, protozoans, fungi and viruses. Emphasis on the presence of non-culturable microorganisms in the marine environment and their research methods.

CMOB 8649. CRITICAL ANALYSIS OF READINGS IN MARINE ECOLOGY
Two credit hours. Four hours of seminar per week.
Study of classical and recent readings in marine ecology. Analysis of author's aims, methods, results, and interpretations.

CMOB 8665. MORPHOLOGY OF MARINE INVERTEBRATES
Three credit hours. Two hours of lecture and one three-hour laboratory per week.
Form, structure and function of representative marine invertebrates.

CMOB 8676. SYSTEMATICS OF MARINE INVERTEBRATES (I)
(On demand). Four credit hours. Three hours of lecture and one four-hour laboratory per week.
Taxonomy, phylogeny and distribution of marine invertebrates with special attention to local forms.

CMOB 8686. ICHTHYOLOGY I (II)
(On demand). Three credit hours. Two hours of lecture and one three-hour laboratory per week.
A study of the morphology, physiology and ecology of fishes, with emphasis on marine forms.

CMOB 8687. ICHTHYOLOGY II (I)
(On demand). Three credit hours. Two hours of lecture and one three-hour laboratory per week.
A study of the systematics, evolution and distribution of fishes, with emphasis on marine forms.

CMOB 8708. CORAL REEF BIOLOGY.
Five credit hours. Three hours of lecture and one five hours of laboratory per week.Exploration of the systemic, evolution, and biological characteristics (structure, modularity, life cycles, reproduction, etc.) of the main organisms forming coral reef communities. Field trips to coral reef communities and laboratory work are required.

CMOB 8709. ECOLOGY AND ZOOGEOGRAPHY OF CORAL REEFS.
Five credits hours. Three hours of lecture and one six hours laboratory per week.
Prerequisite: CMOB 8708 or authorization of the Director of the Department. Field trips are required.

CMOB 8715. ECOLOGICAL CONCEPTS IN MARINE SCIENCES.
Three credits hours. Two hours of lecture and one three hours laboratory per week. Field trips are required.

CMOB 8716. ECOLOGY OF MARINE COMMUNITIES SEMINAR (II)
(On demand). Two credit hours. Two sessions per week.
Composition and quantitative structure of selected marine assemblages, and their energetic and tropic relationships.

CMOB 8994. A, B, C. SPECIAL PROBLEMS IN MARINE INVERTEBRATES (I, II)
(On demand). One to three credit hours. One to three sessions per week.
Supervised study or research on specific selected aspects of marine invertebrates, or techniques pertaining to their study.

CMOB 8997. A, B, C. SPECIAL PROBLEMS IN ICHTHYOLOGY (I, II)
(On demand). One to three credit hours. One to three sessions per week.
Individual student research on marine fishes.

CHEMICAL OCEANOGRAPHY (CMOQ)

GRADUATE COURSES

CMOQ 6615. CHEMICAL OCEANOGRAPHY (II).
Three credit hours. Three hours of lecture per week.
General survey of chemical oceanography, including application of basic concepts of physical and analytical chemistry to the marine environments, chemical interactions of major and minor constituents of seawater, the influence of chemical processes on physical, biological, and geological processes.

CMOQ 6617. MARINE POLLUTION (II)
(On demand). Three credit hours. Three hours of lecture per week. Prerequisite: CMOQ 6615 or CIMA 6615.
Deleterious effects on living resources, human health, marine activities, and water quality caused by the anthropogenic introduction of substances or energy into the marine environment.

CMOQ 8616. OCEANOGRAPHIC TECHNIQUES (I).
Three credit hours. One hour of lecture and one six-hour laboratory period per week; also a three days duration training cruise. Pre-requisite: authorization of the Director of the Department.
Training in the use of standard shipboard and laboratory techniques in physical, chemical, geological and biological oceanography. Planning and execution of a trip on a cruise. Data collection, processing and analysis.

CMOQ 8638. CHEMICAL OCEANOGRAPHY LABORATORY (I).
Three credit hours. One hour of lecture and six hours of laboratory per week.
Laboratory experience in techniques of sampling and handling of marine samples, and the analyses of these samples for major, minor and trace constituents.

CMOQ 8991. A, B, C. SPECIAL PROBLEMS IN CHEMICAL OCEANOGRAPHY (I, II)
(On demand). One to three credit hours. One to three sessions per week.
Laboratory studies of specific problems in chemical oceanography. Topics to be chosen by the student and approved by the professor.

GEOLOGICAL OCEANOGRAPHY (CMOG)

Graduate Courses

CMOG 6616. GEOLOGICAL OCEANOGRAPHY (II).
Three credit hours. Two hours of lecture and one three-hour laboratory per week. For students not majoring in Geological Oceanography.
A review of the basic concepts of geology; geomorphology and structure of the ocean basins and continental shelves; techniques of marine exploration and research; study of the tectonic theories on the origin of marine basins and structural processes; the distribution of sediments, and marine sedimentary processes.

CMOG 8606. COASTAL GEOMORPHOLOGY (II)
(On demand). Three credit hours.
Two hours of lecture and one three-hour laboratory per week. The origin of coastal features and their relationships with shore problems relative to the basic sciences; presentation of the forces that modify the shores. Discussion and field trips.

CMOG 8655. MARINE BIOGEOGRAPHY (I, II)
(On demand). Three credit hours. Three hours of lecture per week.
The origin, speciation and distribution of marine plants and animals in relation to the physical, chemical and physiological aspects of the ocean, with special emphasis on tropical biota.

CMOG 8675. ADVANCED GEOLOGICAL OCEANOGRAPHY (I, II)
(On demand). Three credit hours. Two hours of lecture and one three hour laboratory per week.
A comprehensive review of the geomorphology and structure of the ocean basins; analysis of tectonic theories and structural processes operating in the marine environment; distribution of marine sediments.

CMOG 8706. STRUCTURE OF CORAL REEF.
Three credit hours. One hour of lecture and two three-hour laboratories per week.
Structure, development, and methods of study of coral reefs. Field trips required.

CMOG 8717. SPECIAL PROBLEMS IN MARINE GEOLOGY (II)
(On demand). One to three credit hours. One to three hours of lecture and one three-hour laboratory per week.
Supervised study or research on specific aspects in marine geology.

PHYSICAL OCEANOGRAPHY (CMOF)

GRADUATE COURSES

CMOF 6005. METHODS OF OCEANOGRAPHIC DATA ANALYSIS (II)
(On demand). Three credit hours. Three hours of lecture per week.
Oceanographic data analysis emphasizing computer techniques: exploratory data analysis, regression analysis, scalar and vector spectral analysis, maximum entropy spectral analysis, empirical orthogonal eigen functions, filters, complex demodulation.

CMOF 6006. ATMOSPHERIC AND OCEANIC TURBULENCE (I, II)
(On demand). Three credit hours. Three hours of lecture per week.
Fundamental concepts of turbulence and their application to the study of geophysical fluids.

CMOF 6617. PHYSICAL OCEANOGRAPHY (I).
Three credit hours. Three hours of lecture per week.
General introduction to the study of physical processes in the sea; physical properties of sea water, heat budget, water budget, temperature salinity relationships, light in the sea, equations of motion, vertical stability, Coriolis effect geostrophic motion, general oceanic circulation, waves and tides.

CMOF 6631-6632. GEOPHYSICAL FLUID DYNAMICS I-II.
Three credit hours. Three hours of lecture per week each semester. Prerequisite: authorization of the Director of the Department.
The dynamics of large-scale motions in the ocean and the atmosphere. Theories of stratified fluids in rotation and of geophysical waves.

CMOF 6655 OCEAN SURFACE WAVE MECHANIC
Three credit hours. Three hours of lecture per week. Prerequisite: authorization of the Director of the Department.
The mechanics of ocean surface gravity waves, including theory, kinematical properties, statistics, spectra, and forces.

CMOF 6667. MECHANICS OF COASTAL SEDIMENT TRANSPORT.
Three credit hours. Three hours of lecture per week.
Development of mathematical models to represent coastal sediment transport.

CMOF 8619. COASTAL OCEANOGRAPHY.
Three credit hours. Three hours of lecture per week.
Interactions between long and short period waves and the shore; tides, storm surges, seiches, shoaling wave theories, wave refraction and diffraction, breakers, run-up, longshore currents, near shore sediment transportation, foreshore processes.

CMOF 8990. A, B, C. SPECIAL PROBLEMS IN PHYSICAL OCEANOGRAPHY (I, II)
(On demand). One to three credit hours. One to three sessions per week.
Selected topics in physical oceanography.

Appendix III. Links to Forms and Documents for Graduate Studies Processes

FORM	LINK
Form to Authorize a Waiver of Tuition for Students with Assistantships	http://admin.uprm.edu/grad/daaeg002.pdf
Plan of Graduate Study (DAAEG-003)	https://www.uprm.edu/oeg/recursos-y-documentos-2/
Amendments to the Plan of Graduate Studies (DAAEG-004)	https://www.uprm.edu/oeg/wp-content/uploads/sites/23/2019/11/enmienda-plan-de-estudio-protect-form-nov10.pdf
Form to Authorize Payment of Tuition Fees from External Funds	http://admin.uprm.edu/grad/daaeg002.pdf
Form to Authorize Assistantship Extension	https://www.uprm.edu/oeg/wp-content/uploads/sites/23/2019/11/form-extension-ayud-grad-sep-2012.pdf
Application for the Theses Exam	https://www.uprm.edu/oeg/wp-content/uploads/sites/23/2019/11/formexamoralycert.pdf
Graduation Request form	http://admin.uprm.edu/grad/solgraduacion.pdf
Application for readmission and Internal Transfer	https://www.uprm.edu/registraduria/servicios/
DMS Student Progress Report	DMS Web Page

Appendix IV. Departmental Directory and Contact Information

DMS Faculty	Telephone	Email
Roy A. Armstrong, PhD	(787) 899-2048 ext. 249 (Office) exts. 248; 287 (Laboratory)	roy.armstrong@upr.edu
Travis Courtney, PhD	(787) 899-2048	travis.courtney@upr.edu
Miguel Canals, PhD		miguelf.canals@upr.edu
Juan J. Cruz Motta	(787) 899-2048 Ext. 247	juan.cruz13@upr.edu
Julio Morell, MS	(787) 899-2048 ext. 255 (Office) ext. 243; 257 (Laboratory)	julio.morell@upr.edu
Govind Nadathur, PhD	(787) 899-2048 ext. 259 (Office) ext. 233 (Laboratory)	govind.nadathur@upr.edu
Ernesto Otero-Morales, PhD	(787) 899-2048 ext. 269, 227 (Office) ext. 258, (Laboratory)	ernesto.otero3@upr.edu
Nikolaos Schizas, PhD	(787) 899-2048 ext. 242 (Office) ext. 225 (Laboratory)	nikolaos.schizas@upr.edu
Clark Sherman, PhD	(787) 899-2048 ext. 250 (Office) 278 (Laboratory.)	clark.sherman@upr.edu
Wilford Schmidt, PhD	(787) 832-4040 ext. 2069 (Office) (787) 899-2048 ext. 245 (Office)	wilford.schmidt@upr.edu
Ernesto Weil, PhD	(787) 899-2048 ext. 241 (Office) ext. 272(Laboratory)	ernesto.weil@upr.edu

DMS Administrative Personnel	Administrative Duties	Telephone	Email
Mrs. Maritza Pagán (F-429)	Faculty Issues; External Funds, Student Travel and Fellowships. Property custodian.	787 -265-5408	maritza.pagan@upr.edu
Mrs. Jossie Moulier (F-432)	General Departmental Accounts and non-teaching personnel	787-832-4040 ext. 2194	josefa.moulier@upr.edu
Mrs. Monserrate Casiano F-205	Student issues	(787) 832-4040 ext. 3447, 3443	monserrate.casiano@upr.edu
Mrs. Nilda E. Ramírez (F-205)	Director's Secretary	(787) 265-3838	nildae.ramirez@upr.edu
Mrs. Zulma Martínez Isla Magueyes	Magueyes Issues, Property Custodian	(787) 899-2048 ext. 221	zulma.martinez@upr.edu
Mrs. Lilivette Valle Isla Magueyes	Marine Section and Vessels; Magueyes Visitors Program	(787) 899-2048 ext. 223	lilivette.valle@upr.edu

Other personnel	Duties	Telephone	Email address
Mr. Milton Carlo	DMS Dive Safety Office	(787) 899-2048 ext. 266	milton.carlo@upr.edu
Mr. Orlando Espinosa	Captain	(787) 899-2048 ext. 255	orlando.espinosa@upr.edu
Frank Lazu Amaez	Diver	(787) 899-2048 ext. 284	
Botero/Guard	Transportation and Surveillance.	(787) 899-2048 ext. 239	n/a

Centers	Contact Person	Telephone
DMS Computer Laboratory	Mr. Wilson E. Rodríguez Ribot	(787) 899-2048 ext. 261
DMS Visitor's Laboratory	Mrs. Lilivette Valle	(787) 899-2048 ext. 223
CaRA Caribbean Regional Association (CariCOOS)	Prof. Julio Morell	(787) 899-2048 ext. 279, 255
CCRI (Caribbean Coral Reef institute)	Dr. Juan José Cruz Motta	(787) 899-2048 exts.280, 281, 282

Appendix V. General Contact Information

	MAYAGÜEZ MAIN OFFICE	ISLA MAGUEYES MARINE LABS
Office Address:	Department of Marine Sciences University of Puerto Rico, Mayagüez PO Box 9000 Mayagüez, Puerto Rico 00681	Department of Marine Sciences University of Puerto Rico, Mayagüez PO Box 9000 Mayagüez, Puerto Rico 00681
Office Phone:	(787) 265-3838	(787) 899-2048 exts. 221;223; 222
Office FAX:	(787) 265-3838 (787) 265-5408 (787) 832-3432	(787) 899-5500
Shipping Address	359 Blvd. Alfonso Valdés Physics, Geology and Marine Sci. Building Office F-205 Mayagüez, PR	End Road 304 Isla Magueyes, La Parguera Lajas, Puerto Rico 00667

XVII. ACKNOWLEDGEMENTS

Members DMS Graduate Policy Committee 2020-2021

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